QL
671
.A957
SLRA

AVICULTURAL MAGAZINE

VOLUME 121
No. 1
2015

THE AVICULTURAL SOCIETY

The Avicultural Society was founded in 1894 for the study of British and foreign birds in the wild and in captivity. The Society is international in character, having members throughout the world.

Membership subscription rates per annum for 2014: British Isles £21.00: Overseas £24.00 (plus £6.00 for airmail). (UK funds please). Full-time students £12.00, Overseas £15.00 (please state course attended). The subscription is due on **1st January of each year** and those joining the Society later in the year will receive back numbers of the current volume of the AVICULTURAL MAGAZINE.

KATE ATWELL, SECRETARY-TREASURER, THE AVICULTURAL SOCIETY, 11 THE BRIARS, BACKWELL, NORTH SOMERSET, BS48 3LE, UK.

Subscriptions can be made by Paypal at www.avisoc.co.uk, by cheque, or directly to The Avicultural Society Account, Barclays Bank, Southminster Branch. Please quote Account No. 13296954, Sort Code 20 54 30, and ensure you send your name as the account reference, or else we cannot match payments. In case of difficulty please contact the Treasurer at the address above, or email kateatwell@googlemail.com.

Website: **http://www.avisoc.co.uk**

The AVICULTURAL MAGAZINE welcomes articles and news items from both members and non-members (no payment is made). These can be about any aspect of aviculture, conservation or natural history concerning non-domesticated bird species that is likely to be of interest to aviculturists. Articles submitted for publication should preferably not have been published elsewhere, and should ideally be written in English, though translation is possible. Scientific as well as vernacular bird names should be given, and references cited in the text should be listed at the end of the article. Material can be sent as an email attachment to editor@avisoc.co.uk and can be accepted in most common file formats. Files on disk and typed or handwritten manuscripts are also accepted. Line drawings, black and white or colour photographs can be used to illustrate articles and should be clearly captioned. Tables and graphs submitted will be used whenever possible. Graphs should ideally be accompanied by the relevant source data.

ADDRESS OF THE EDITOR:

MARTIN GREENE, THE AVICULTURAL MAGAZINE, VALE COTTAGE, HEMINGTON, RADSTOCK, SOMERSET, BA3 5XU, UK. Email editor@avisoc.co.uk.

Cover Picture: Red-crested Cardinal *Paroaria coronata* by Gregory Guida

AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY

Vol. 121 - No. 1 All rights reserved ISSN 0005 2256 2015

The Avicultural Society

FOR THE STUDY OF BRITISH AND FOREIGN BIRDS
IN THE WILD AND CAPTIVITY

OFFICERS AND COUNCIL
As from April 2015

President
C.J.S. Marler

Vice Presidents
F. Barnicoat (South Africa)
S. Bruslund (Germany)
M. Curzon MBE (UK)
Dr. H. Quinque (France)
R.L. Restall (Venezuela)
Dr. R. Wilkinson (UK)

Editor
M.C. Greene

Secretary - Treasurer
Ms. K. Atwell

Members of the Council
A. Brooker
P. Convy
D. Cullen
Mrs. L. Gardner
R.B. Girling
C. Kent
G. Masson
S. Matthews
R. Piper
P.G. Schofield
M. Sproule
J.G. Thurlow

Chairman N.R. Hewston

SMITHSONIAN
OCT 07 2015
LIBRARIES

AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY

Vol. 121 - No. 1 All rights reserved ISSN 0005 2256 2015

FROM THE CHAIRMAN

I must apologise for the late appearance of this issue. The production of the species index which preceded it was more complex and exacting than anticipated. Special thanks are due to Gregory Guida, whose photographs appeared on the covers of and inside the index issues, and again on the cover of this issue. Gregory has very kindly given us permission to use a number of his superb photographic portraits which feature a wide range of birds. Some are taken in captive situations but many show birds in their natural habitat. All are exactly the sort of high quality images we hoped to be able to bring you when we introduced colour covers. If you have, or have access to, images of similarly high quality which we could use for future issues, please contact the editor.

The Society held two successful meetings in the space of eight days in July. The first took place at the Cotswold Wildlife Park, where members were treated to a talk by Simon Matthews on breeding Birds of Paradise at Al Wabra Wildlife Preservation, where he was until recently Curator of Birds. Simon was briefly in the UK en route to taking up a new post working with threatened species in Hawaii. Our thanks to the Park for their generous hospitality. Thanks also to Graham Lee, who kindly hosted the second meeting. Members were able to see his specialist collection of Parrotfinches and other estrildines, and find out about his techniques for breeding these birds, before enjoying a convivial barbeque.

Neither of these meetings was initiated by Council – both came about through members seeing opportunities for interesting meetings and helping to organise them at short notice. So if you have ideas for similar gatherings please get in touch.

The 2016 AGM will also be held at Cotswold Wildlife Park. We will be sharing the venue with the International Turaco Society, which we hope will add to the interest of the day. The date is provisionally set for Saturday April 9th. This will be confirmed in October and full details will be available nearer the date.

Nigel Hewston

EXPERIENCES WITH COLLARED FINCHBILLED BULBULS *Spizixos semitorques* AT BLACKPOOL ZOO, UK

By James Caldwell

Species overview

The Collared Finchbill *Spizixos semitorques*, also known as the Chinese Finchbill or Swinhoe's Finchbill, is a species of bulbul native to areas of China. Adults measure around 21-23cm long, having a black head with white streaks across the face and a white collar separating the dark head from the olive body (Del Hoyo, 2005). The sexes are similar but females are slightly smaller and juveniles have a darker body but lighter head and an altogether greyish colour. They are classified by IUCN as a species of least concern in terms of endangerment (IUCN 2014) and are common across their range in Taiwan and South China, specifically common in Sichuan and Fujian. They have been seen to be very tolerant of human interference and man-modified environments, making them great specimens to keep in aviaries that can be heavily modified to fit their needs.

Although previously kept in zoos in Europe, this species was not present in any other public collection in Europe when it was acquired by Blackpool Zoo in February 2014. The zoo brought in a pair of Collared Finchbills from a reputable breeder in the north of England who had previously obtained multiple pairs from mainland Europe. The pair was housed, along with a pair of Omei Shan Liocichlas *Liocichla omeiensis*, in an off-show enclosure for a 30 day isolation period, which allowed faecal samples to be taken to ensure no harmful pathogens were brought into the collection. After the results were found to be clear and the 30 days isolation period was up, both the Finchbills and the Liocichlas were moved to a very well planted on-show aviary. The aviary also housed a pair of Tambourine Doves *Turtur tympanistra*, one Bobwhite Quail *Colinus virginianus* and one White-cheeked Turaco *Tauraco leucotis* – the latter left the collection shortly afterwards.

Housing and husbandry at Blackpool Zoo

The aviary in which this species is housed at Blackpool Zoo is 9m x 2.7m x 5.5m x 4.5m with two sides being brick wall, and one side zoo-mesh. The remaining side separates the enclosure from another aviary that houses a pair of Von der Decken's Hornbill *Tockus deckeni*, a pair of Lady Ross's Turaco *Musophaga rossae* and one White-browed Coucal *Centropus superciliosus*, meaning that the birds from either aviary can see those in the one adjacent.

The Aviary

The height of the aviary is 3m with a zoo-mesh roof. The enclosure contains a small pond; however it was covered over with mesh once the Finchbills had chicks, to prevent the possibility of them falling in. It was also left to stagnate to encourage wild invertebrates in the enclosure for natural foraging.

The rest of the aviary is heavily planted, with a butterfly bush *Buddleja davidii* taking up a large portion of the aviary. The Virginia Creeper *Parthenocissus quinquefolia* that climbs up the corner of the aviary provides some shelter from the sun and a sight barrier from the public, as well as providing some habitat immersion from the outside. The foliage in the enclosure encouraged lots of wild invertebrates for the birds - including insects such as mosquitoes and greenflies. The Finchbills appropriately built their nest on the side of the aviary furthest from the keeper access door, allowing keepers to provide fresh food and water, as well as live food without having to go near to or disturbing the nest.

The diet of this species in the wild is one of mainly small fruits, complemented with some small insects. During the breeding season this balance shifts slightly to incorporate more insects, especially when feeding young. The diet chosen to feed to this species at Blackpool Zoo consists of finely chopped fruit such as apple, papaya, grape and banana; finely grated and chopped carrot; boiled and crushed egg; and Witte Molen frugivorous mix for softbills. The food is also sprinkled with Avipro Plus to boost vitamin levels, which was especially useful to maintain the birds' health during stressful periods, such as the transportation and relocation within the zoo. This diet is presented in a D-cup hooked onto the mesh wall of one side of the aviary, with a bowl also placed on a raised platform under the cover of the dense buddleia. Scattered feeds of mealworms and small brown crickets were originally given three times daily and later pinky maggots as well, these were also placed in the food dishes and in a unique live food bowl so that the Finchbills knew where to look. It is worth noting that the Omei Shan Liochichlas have a very similar diet, the only different being that the Witte Molen mix is of the insectivorous variety, instead of frugivorous, as they are known to eat more insects than fruit. The Tambourine Doves also have an insectivorous tendency, which means the live food has to be substantial enough to provide for the pair of Omei Shans and the Tambourine Doves as well as the Collared Finchbills.

Breeding at Blackpool Zoo

Small wicker baskets were placed in the enclosure attached to branches to encourage nesting and coconut fibre, as well as disinfected reindeer hair, was scattered around the enclosure. On the 26th April 2014 it was seen that the pair had begun to build their nest in one of these baskets attached to an Alder tree.

The Finchbill Nest

The Finchbill Nest with Eggs

They used grass and coconut fibre to build the majority of the nest. Just two days later an egg had been laid and the following day another egg followed. The female then began to sit on the two eggs. The eggs were incubated for 11 days and the first chick hatched on the 10th May. For 4 days after this the female was seen to be feeding at least one chick, although it was uncertain whether another chick was in the nest or not. The chick fledged on the 22nd May and shortly afterwards a second chick was seen to be in the nest, which fledged the following day. The next morning the second chick was found dead in the aviary and looked slightly underdeveloped, whilst the remaining chick appeared to be very healthy and still feeding from its parents. It was also noted that the Liocichlas in the aviary were seen carrying food to the nest too, which was tolerated by the parent birds.

The Parents with the Fledged Young

On the 31st, just 9 days after the first chick fledged, the parents were seen to be rebuilding their nest, with the first egg of this clutch being laid on the 2nd June. The parents laid three eggs this time around, and the female was seen to sit on the eggs in earnest from the 5th June. On the 19th June, two chicks were seen in the nest and one was found dead on the floor away from the nest. On this day the decision was made to catch the older chick from the first clutch which had begun to feed independently.

This chick was moved into a separate off-show aviary to avoid aggression from the parents, because they had new chicks to care for. The juvenile initially seemed stressed and unsettled in the new habitat. So, close observation was kept on it and it did settle with time. On the 28th June, 9 days after the two chicks had been seen, they both fledged the nest on the same day, however one was brought in after a few days when it was found in the morning on the floor heavily plucked. This juvenile seemed to have been attacked by the parents as they had begun the next attempt at nesting.

The next day, the 5th of July, it was discovered that the pair had laid the first egg of their third clutch. They continue to rear youngsters in the aviary and at the time of writing have reared five chicks and are on their fourth clutch of eggs.

Hand-rearing at Blackpool Zoo

In July 2014 three Collared Finchbill eggs were donated to the zoo from a reputable private breeder as the adult birds were being moved to another collection.

These eggs were incubated in the Grumbach incubator for 11 days and a single egg hatched. The chick was placed in a small nest made of coconut fibre, inside a brooder. For the first 24 hours the chick was not fed, only being given fluids at 12 hours old. The second day the chick was fed every two hours starting at 8am and ending at 10pm. It was fed pinky mice and papaya fruit at a ratio of 50:50 which was slurried to make a paste, with Avipro Plus powder. This slurry was fed to the chick on the end of a pair of tweezers. The chick was weighed every morning and was fed until it stopped begging every two hours. It only passed the first faecal sac on the second day, which was when its appetite began to grow and its weight increased. On the morning of the second day the chick weighed 2.4g, while on the third day it had increased to 3.7g. By day 6 it weighed 5.5g. This weight increase looks promising for the zoo and the handrearing of the chick is currently ongoing with high expectations.

Summary

The breeding at Blackpool Zoo has been subject to trial and error, but some factors appear to be important in aiding the success: the wicker nesting pans encouraged the first-time parents, along with appropriate nesting material to build adequate nests; the frequent and abundant live feeds throughout the day when the chicks hatched; minimal disturbance in the aviary – and of course providing fresh food and water daily away from the nesting area.

The Collared Finchbills have been a very interesting and attractive aviary subject, which have been a joy to watch and to work with. They have a very strong instinct to breed and act like a living conveyor belt, producing chicks and then very quickly driving them away to begin the next round. It is a wonder that these birds have never been established in captivity, as they are far from difficult to care for and breed. Birds have been obtained from different bloodlines in the hope of being able to send pairs of birds to other institutions very soon in the hope of creating a viable captive population.

References

Del Hoyo (2005) The Handbook of Birds of the World vol. 10. *Order Passeriformes.*

IUCN (2014) The IUCN Red List of Threatened Species. Available at <www.iucnredlist.org> accessed on 10/08/2014.

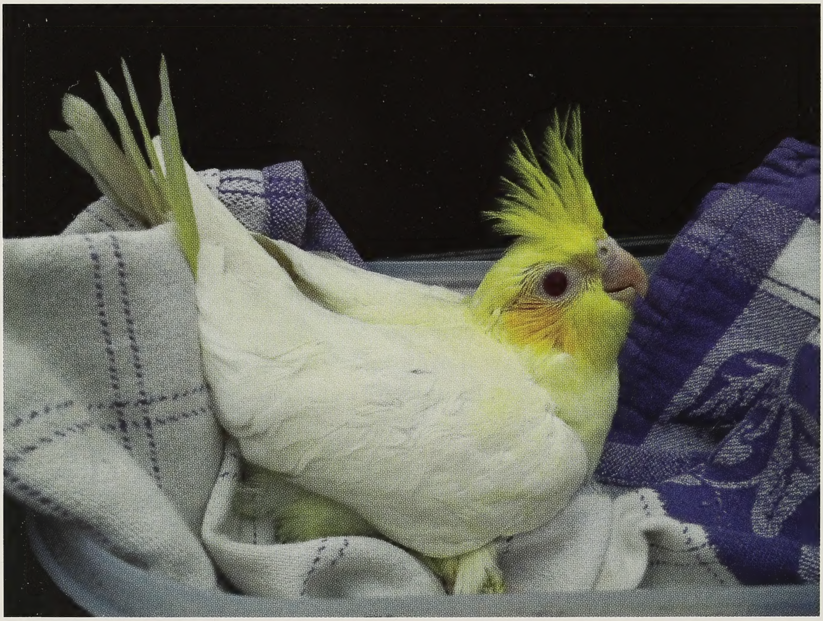
AN INTRODUCTION TO COCKATIELS *Nymphicus hollandicus*

By Bert Van Gils

Introduction

Practically every parrot lover knows what a Cockatiel looks like. In many parts of the world, together with Budgies and Lovebirds, it is one of the most common species in captivity, suitable for beginners. In other words, it is a bird species that introduces people from all around the world to the fascinating hobby that is aviculture.

The Cockatiel is a member of the Cockatoo family *Cacatuidae*, segregated from a common ancestor about 20 million years ago, according to White et al. (2011). In that much time a lot can change, even by the laws of Mother Nature, who did just that by creating a quite distinct Cockatoo genus and species. Yet, some common features remained: an erectile crest, male and female who take turns in sitting on the eggs, a different feather structure compared to other parrot species. As many of their Cockatoo family members, the Cockatiels' native range is confined to large parts of Australia.



Cinnamon-Yellowcheek Bronze fallow chick

Housing

Dimensions of a suitable aviary for a pair of cockatiels that are kept outside for breeding, are 2m length, 1m width and 2m high. Larger dimensions are obviously even better. Access to an inside enclosure as protection from rain or cold isn't really necessary as long as you make sure that part of the aviary is roofed and provides protection from the wind. In the past all my cockatiels had access to an inside enclosure, but hardly ever used it even during harsh winter conditions.

The mesh size I use is 12.5mm square, this prevents rats from entering the aviary but unfortunately not very small rodents. A Cockatiel aviary could be made from wood, as they don't chew that much compared to other parrot species. Dry river sand over a concrete, tiled or hardwood floor makes a good groundcover. It provides the birds with the opportunity to dust bath, water from droppings is quite quickly absorbed and cleaning is easy by using a brush and/or shovel. For roofing I use light-transmitting materials (plastics), creating a well-lit aviary. Perches are made from branches of Hazel *Corylus avellana* or sometimes fruit trees like Malus or Prunus spp.

Branches with leaves, buds and flowers provide excellent enrichment for caged birds, as do wooden blocks, toys and garden weeds. The best enrichment of all is one or more birds of the same species with which to interact.

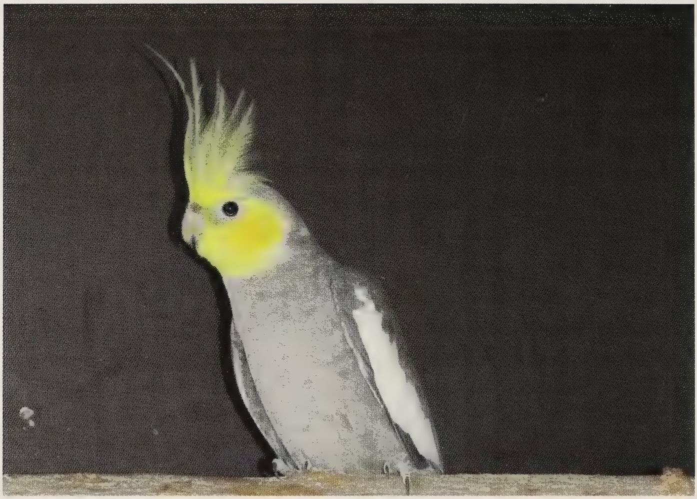
Food

A nutritious and balanced diet for Cockatiels starts with a decent seed mix. Mine is a commercial seed mixture of 10 kinds: millet, safflower, milo (sorghum), niger seed, hemp, canary seed, buckwheat, paddy rice, oats and wheat. Sunflower seeds are added manually to the mixture (about 5%), before feeding. Egg food is offered only once or twice a week outside the breeding season. Most commercial brands for small parrots are fine; you just might add a little water to moisten them before feeding. During the breeding season, egg food is provided daily.

Food and water are refreshed daily and offered in different bowls on a feeding tray: this mostly prevents contamination by droppings. A piece of fruit or vegetable, like apple, pear, broccoli, lettuce or pepper, could be offered on a daily basis. Unfortunately, most fruit and vegetables are not much appreciated by most of my Cockatiels. What they do like very much are weeds like Chickweed *Stellaria media* or wild grass seeds. I'm no big fan of all kinds of supplements and vitamins, or the giving of (preventive) medication mixed with the food. The only supplements I give are bird grit and a cuttlefish bone.

Breeding

Cockatiels are well known as being easy and eager to breed. After the juvenile moult, which usually happens between 5 and 7 months of age, normal grey males get a yellow mask with a bright red cheek patch. This makes them easy to recognise. However, in the pied colour mutation, both sexes could have a yellow mask (or not). Also the less obvious dimorphic features (tail barring and wing spots) no longer differ between the sexes in pied specimens, making visual sexing practically impossible. Monitoring the behaviour (male whistling) could be helpful, or otherwise DNA sexing is an option that has become a lot cheaper recently.



Yellowcheek Male

I consider the best time for breeding, taking into account both temperature and length of the day, is between April and September. Breeding pairs are housed separately and each is allowed to have no more than two clutches per year. Prior to the breeding season, egg food and sunflower seed is slightly increased to stimulate breeding. When the chicks are hatching these foods are further increased until both are about 20% each of the total amount of food. Nest boxes measure 20-25cm square and 30-35cm in height, with a 7cm diameter hole. A mixture of hemp straw with beech and eucalyptus wood, all chipped into small pieces, is used as nest material. From the moment the nest boxes are supplied, the breeding season begins! My experienced breeding pairs lay their first egg as early as 6 days after getting their nest box.

I personally breed with several pairs of the sex-linked Yellowcheek mutation. These are known to be difficult to breed, even now 25 years after appearing. Many pairs have difficulty incubating their eggs, for them I use a Rcom 20 incubator for half of the clutch (the other half remains with the parents, for practice). Temperature is set at 37.3°C and humidity at 40 to 45%, with an increase to 50% on the day before hatching. In literature an incubation period of 18 to 21 days is mentioned for Cockatiels. When using an incubator my experience is that it takes 18 days, plus or minus 1 day. When replacing the removed eggs with dummies, chicks can quite easily be returned to the nest after hatching in the incubator, as long as the parents are still incubating. I've used these methods at least 10 times now and found them to be successful.

At an age of 10 to 12 days, the chicks can be ringed with a closed ring of 5.5 or 6mm diameter. Obviously, this requires nest inspection. I condition all of my breeding pairs to nest inspection, by looking into each nest box every day from the moment they are put in the aviary. After a while, almost all birds get used to this kind of disturbance. At the age of around 30-32 days, the chicks fledge and two to three weeks later they are independent, although they often continue begging for food from their parents for some time.

Cockatiel colour mutations

Over the past decades, several colour mutations have appeared in Cockatiels. Currently there are 10 different colour mutations in Europe, so far as I know. There are five autosomal recessive mutations: pied, whiteface, paleface (pastelface), bronze fallow and ashen fallow (recessive silver). There are four more that have sex-linked inheritance: cinnamon, opaline (pearl), lutino and sex-linked yellowcheek, and finally one (incomplete) autosomal dominant mutation: dominant edged (dominant silver). The albino is not a colour mutation by itself, but a combination of lutino with whiteface. I use the international naming system as proposed by MUTAVI in 1999, in corporation with Ornitho Genetics vzw and Dr. Terry Martin (Van den Abeele, 2013, page 62-69). All these colour mutations (except opaline) affect the presence or distribution of only one of both pigment classes: eumelanin (black, grey and brown) and psittacins (red, orange and yellow). For further reading on Cockatiel colour mutations, I recommend the excellent book of Martin and Andersen (2007).

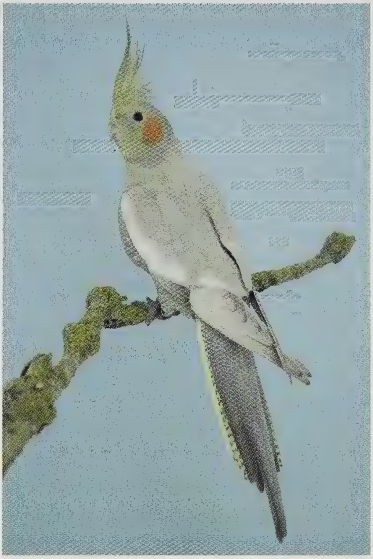
Many colour mutations are found in more than one, if not dozens of different parrot species, like the lutino and cinnamon. In Cockatiels however, several mutations are unique ... at least this seems so at first sight. Of the 10 colour mutations mentioned above, there is actually only one unique to Cockatiels and that is the sex-linked yellowcheek. Whiteface and paleface are actually two very common mutations in parrots, because genetically they are the same as the blue and turquoise (or Aqua) mutations, respectively. Then why do they look so different in Cockatiels? The answer lies in the Cockatiels' feather structure. Compared to other parrot species, Cockatiels – and all other Cockatoos – lack a certain layer inside the feather barbs and barbules that creates structural colour. Therefore, Cockatiels can never show true structural colours like blue and green. For this reason too, the names of the colour mutations are different in cockatiels, to better fit their visual appearance.

Many colour mutations, especially the ones that originated more recently, still need improvement on posture, size and feathering. These flaws are mostly related to genetics. Therefore, breeding visual to visual is not recommended. Instead, breeding visual to split and outcrossing visuals to normal greys to produce high quality splits, is the way forward.

Conclusions

Cockatiels are a common species, kept in huge numbers around the world that are suitable for beginners. In terms of food and housing they are not very demanding. They are eager to breed, but make sure they get enough rest between clutches. Sexing birds is easy after the juvenile moult, except for pied birds that cannot be sexed visually.

Cockatiels have quite a palette of colour mutations. The names and visual appearance of several colour mutations are different from other parrots, because Cockatiels have a different feather structure which prevents them from showing structural colours like blue and green. As you can see, this beautiful little parrot species has some unique features one would not expect at first sight!



Single factor dominant edged chick

Information on the author:

Bert Van Gils lives in Belgium and he is the vice-president of the Belgian Parrot Society (BVP). He started breeding Cockatiels in 1999 and still does. He is also a board member of a Cockatiel study group. Cockatiel colour mutations and genetics are his favourite subjects.

If you would like to contact the author for more information his email address is:
bertvang@hotmail.com

References

Martin T. & Andersen D. 2007. A guide to cockatiels and their mutations as pet & aviary birds. ABK publications, 198p.

Van den Abeele D. 2013. Agaporniden, handboek en naslagwerk. Revised edition 2012-2013. Deel 2. 560p. (English version to be expected soon).

White N.E., Phillips M.J., Thomas M., Gilbert P., Alfaro-Núñez A., Willerslev E., Mawson P.R., Spencer P.B.S. & Bunce M. 2011. The evolutionary history of cockatoos (Aves: Psittaciformes: Cacatuidae). Molecular Phylogenetics and Evolution, 59: 615-622.

NATURALISTIC INSECTIVOROUS BIRD DIETS IN ZOOS

By Francis Cabana M.Sc. and Dr Amy Plowman

Many carnivorous birds in captivity are fed a standard diet which includes some sort of concentrated food, such as an egg patee or pellet. The Chestnut-backed Thrush *Zoothera dohertyi* is primarily a specialist insect eater, yet it is often fed a similar diet to less specialised carnivorous birds (faunivorous) such as the Red-billed Blue Magpie *Urocissa erythrorhyncha*, whose diet is much more animal based (see below). This study is aimed at comparing the nutritional and behavioural effects of replacing the egg patee in their diets with an insect patee, Haith's Prosecto. This insectivorous feed has shown itself to be as good in terms of quality as an egg-based patee. It proved to be palatable to the birds and has a macronutrient make-up (protein, fat and carbohydrate) that is suitable for faunivorous birds. While the birds under study were fed Prosecto, they were significantly more visible and more frequently seen feeding, flying, moving and being vigilant. It is important to mention, that due to the low sample size, this study can only be used as a basis for future studies, (as well as indicating the advantages of Prosecto insectivorous feed).

Introduction

The ability to fly has given birds an advantage over terrestrial animals in terms of foraging; but it has also placed severe constraints upon their physiology and metabolism. Few avian species have adapted to foods low in nutrition such as leaves and grasses. Morphological features, anatomy and the physiology of the gastrointestinal tract, plus metabolic capacity and nutrient requirements all set the broad limits of potential food sources appropriate for a specific bird species to consume (Stevens and Hume, 1995). The terms laid out in De Graaf *et al.* (1985), based on the bird's trophic level (position in the food chain) based on what they will primarily eat, will be used as classification for reasons of simplicity.

The Red-billed Blue Magpie *Urocissa erythrorhyncha* is known as a faunivore because of its high intake of animal prey such as snakes, amphibians, lizards, eggs, chicks and small mammals. This species also ingests a high number of invertebrates which are available all year round. The Red-billed Blue Magpie occasionally forages for fruit, nectar and some seeds (BirdLife, 2004). This species will often separate the digestible soft tissues and the indigestible components of a prey instead of ingesting it whole and egesting the skeleton (Klasing, 1999). This suggests behavioural adaptations to preying on other animals, which could have had evolutionary consequences on its digestive tract. Unfortunately, no digestive tract information appears to be available, at least in the western literature in English for this particular species.

At Paignton Zoo Environmental Park, the Red-billed Blue Magpies are kept in pairs and are fed a diet of fruit, vegetables, egg patee, hard-boiled egg, cooked and raw horsemeat, mice or chicks and a pinch of mealworms (larvae of *Tenebrio mollitor*). A similar diet is also given to Chestnut-backed Thrushes *Zoothera dohertyi*, birds which are also faunivorous, but which specialise in ingesting invertebrates rather than small vertebrates (Trainor *et al.*, 2008).

Working on the assumption that zoo diets should mimic the natural food of their animals as far as possible in order to promote positive welfare and to encourage expressions of natural behaviour, it can be argued that improved welfare should result from the addition of invertebrates as a food source for both of these species of bird (Kawata, 2008).The study described here aimed to replace the egg patee that both of these birds consumed daily with an insectivorous patee (Haith's Prosecto Insectivorous Patee) and then to try and evaluate any changes in behaviour that might reflect a change in welfare. The palatability and quality of the diets was assessed and compared.

Materials and Methods

One pair of Red-billed Blue Magpies (1.1) and one pair of Chestnut-backed Thrushes (1.1) were each studied at Paignton Zoo Environmental Park. There is no sexual dimorphism within these species during the winter season; therefore, the observer could not differentiate between individuals. Both species were used for the intake study, but only the magpies were involved in the behavioural observations. The thrushes could not be observed directly because the location of their enclosure was secluded for breeding.

Intake

The same protocol was followed for each individual. During week 1, a four day study was conducted on the animals' original diets measuring the amounts consumed. Diet 1: this diet consisted of a pre-prepared fruit mix, hard-boiled egg, both raw and cooked horsemeat and an egg patee. The magpies also received one day old chick or dead mouse and mealworms. During week 3, the diet was gradually changed to Diet 2, which is the same as Diet 1, but the egg patee was replaced with the Haith's Prosecto insectivorous feed. The study aimed to replicate the daily husbandry and nutrition of these animals. Therefore, the quantity of food was chosen by the keepers as on any typical working day. The last four-day intake study took place during week 4.

All intake studies followed one methodology. All food prepared was weighed individually before being mixed by the keepers. One plate of the same ingredients in similar quantities was left in the animals' environment in order to calculate the desiccation coefficient. On the next day, all food remaining was picked-up, separated and weighed again. This was repeated on four more occasions.

Behavioural observations

Before the official behavioural sampling began, random observations were conducted to build an ethogram (a list of behaviours) for the magpies. Behaviours observed were feeding (includes pecking, ingesting, foraging or foot-stamping on the ground), bathing, grooming, flying, moving on the floor of the aviary. Further noted behaviour included degrees of vigilance. At ease: the bird is on a flat surface or perched with legs tucked under its body in a seemingly relaxed pose, legs not visible, barely moving head if at all and the feathers usually somewhat partially erect; mildly vigilant: the bird is standing on a flat surface or perching with one or both legs visible, or hanging from a vertical surface such as a branch or net with tail feathers relaxed with frequent head movements; highly vigilant: the specimen may be perching or on a flat surface with tail feathers erect with mild ruffling and gaze focused on one specific stimulus. Observation times were between 09:30 to 12:30 and 13:30 to 16:30 five days a week for two weeks for each of the diets.

Within each period, two blocks of 15 minutes were used to observe the animals; this was achieved using instantaneous scan sampling at 15 second intervals. The blocks were at random times and were counterbalanced. Data collection occurred during weeks 1, 2, 4 and 5.

Behaviours were averaged into an activity profile for each day, and the ratio of each behaviour during the original diet (Diet 1) were compared with the ratios of each behaviour during Diet 2. Non-parametric Wilcoxon signed rank tests were used because of the non-normal distribution of the data, as well as the small sample size. The statistical analysis was looking for a significant difference after a change in condition on the same specimens. In this case the change of condition was a diet change, rendering the use of linear mixed models useless. The behavioural samples taken were not normally distributed, therefore only non-parametric tests are appropriate for use. Finally, because behaviours were compared on the same specimens, a Wilcoxon signed rank test was deemed fitting. (*See footnote).

Results

3.1 Intake Study

The ingested amounts of the different feed items were calculated and adjusted using the desiccation coefficient, then averaged into a daily individual feed intake amount which took place over the course of the study. As depicted in Figure 1 and Figure 2 for the Chestnut-backed Thrush and Red-billed Blue Magpie respectively, the first diet, including the egg patee, is compared with the second one that included Prosecto.

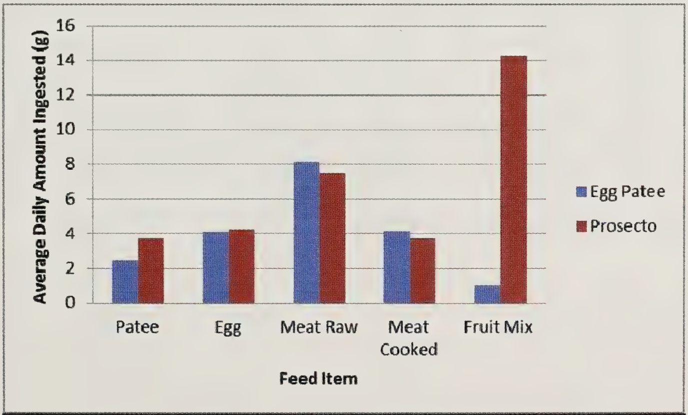


Figure 1: The average amounts ingested by the chestnut-backed thrush on similar diets, each differing only by the type of patee used. Results shown here are averages of the five- day intake study with desiccation coefficient.

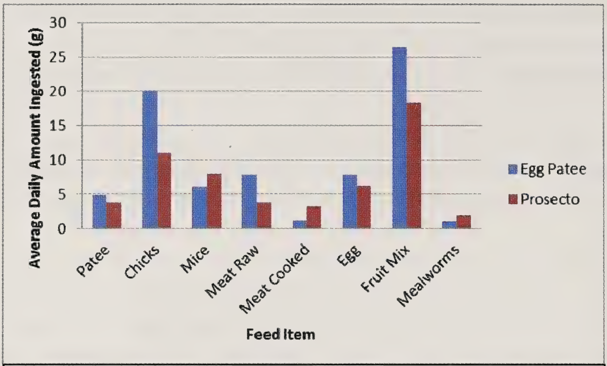


Figure 2: The average amounts ingested by the red-billed blue magpie on similar diets, each differing only by the type of patee used. Results shown here are averages of the five- day intake study with desiccation coefficient.

The nutrient levels of each diet as presented and as ingested are shown in table 1 and 2 for the Chestnut-backed Thrush and Red-billed Blue Magpie respectively. The amount of energy in Kcalories reported was calculated using the proximate analysis provided by each feed's maker.

Table 1: Shows the quantity of nutrients in the average provided diet for the Chestnut-Backed Thrush and the average ingested diet of both patee diets, all based on dry matter.

	Diet 1		Diet 2	
	Given	Ingested	Given	Ingested
Crude Fat (%)	11.74	18.19	13.44	20.85
Saturated Fats(%)	2.30	3.91	3.07	5.61
Crude Protein (%)	22.62	36.46	26.03	34.76
Crude Fiber (%)	1.03	0.96	2.71	2.19
Vit A (IU A/g)	44.09	7.78	33.77	22.65
Vit B6 (mg/kg)	3.63	6.03	24.35	15.00
hVit C (mg/kg)	26.90	24.56	24.08	17.99
Vit E (mg/kg)	36.87	63.81	15.44	22.06
Calcium (%)	0.27	0.46	0.38	0.37
Copper (mg/kg)	3.14	4.86	4.29	3.83
Iron (mg/kg)	36.57	60.87	205.40	190.70
Magnesium (%)	0.07	31.59	0.12	0.12
Phosphorous (%)	0.61	1.06	0.64	0.76
Potassium (%)	0.39	0.49	0.67	0.69
Sodium (%)	0.23	0.39	0.51	0.56
Zinc (mg/kg)	45.03	77.34	25.25	33.91
Energy (Kcal/g)	3.68	4.23	3.33	4.12
Dry Matter (g)	12.80	7.20	14.46	12.52

Table 2: Shows the quantity of nutrients in the average provided diet for the Red-Billed Blue Magpie and the average ingested diet of both patee diets, all based on dry matter.

	Diet 1		Diet 2	
	Given	Ingested	Given	Ingested
Crude Fat (%)	16.27	19.02	16.78	19.48
Saturated Fats(%)	2.12	1.93	2.50	2.54
Crude Protein (%)	32.78	38.70	32.54	36.76
Crude Fiber (%)	0.87	1.15	2.01	2.05
Vit A (IU A/g)	31.31	33.90	30.16	29.56
Vit B6 (mg/kg)	2.66	2.80	16.17	13.44
Vit C (mg/kg)	16.65	18.94	12.31	11.22
Vit E (mg/kg)	48.97	69.07	32.53	40.73
Calcium (%)	0.69	0.93	0.75	0.91
Copper (mg/kg)	4.19	5.53	4.56	5.64
Iron (mg/kg)	68.84	72.59	186.82	198.16
Magnesium (%)	0.09	0.006	0.20	0.17
Phosphorous (%)	0.09	0.80	1.67	1.42
Potassium (%)	0.48	0.54	1.87	1.55
Sodium (%)	0.39	0.4	0.72	0.69
Zinc (mg/kg)	62.83	71.87	43.31	48.30
Energy (Kcal/g)	4.23	4.78	4.76	5.19
Dry Matter (g)	30.16	19.85	29.85	15.08

Behavioural Observations

Activity budgets were calculated using daily observations for both before and after a change to Haith's Prosecto feed. The activity budgets for the magpies are shown in Figure 3. Each of the behaviours were individually tested using a non-parametric Wilcoxon paired-signed rank test. These showed that feeding, flying, locomotion, mildly vigilant and out of sight were significantly different following the change in diet (Table 4).Comfort behaviours were not analysed because of their low prevalence. Seven behaviours were tested; therefore, a significant confidence interval of 0.043 was chosen.

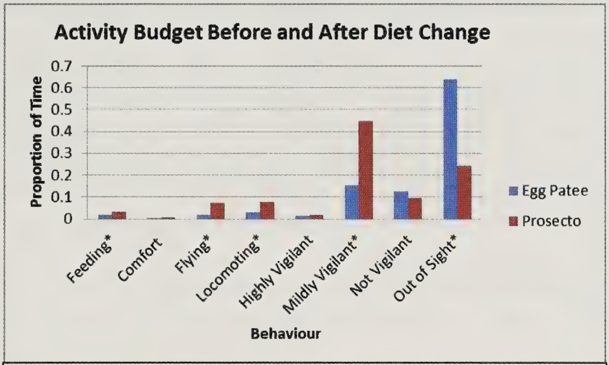


Figure 3: Histogram depicting the change in activity budget of the Magpies before and after a diet change.

*There was a significant change in the expression of this behaviour after the change to Prosecto

Table 4: Results of Wilcoxon signed-ranked tests when looking for a significant difference in the Magpie's activity budget after a change in diet.

Behaviour	n	Z	P-value
Feeding*	10	-2.601	0.009
Flying*	10	-2.807	0.005
Locomotion*	10	-2.803	0.005
Highly Vigilant	10	-0.178	0.859
Mildly Vigilant*	10	-2.803	0.005
Not Vigilant	10	-0.663	0.508
Out-of-Sight*	10	-2.803	0.005

Discussion

The results of this study are, of necessity, limited to the individuals that were studied; the small sample size (two birds of each species) means that one cannot extrapolate from them insofar as the entire captive population is concerned. Nevertheless, the findings serve as useful first steps for further studies and indicate the good quality of Haith's Prosecto bird feed.

The thrushes seemed to prefer the Prosecto feed to the egg patee (Figure 1) but the opposite proved true for the magpies (Figure 2). The differences are small enough to infer that each feed might be as palatable as the other. The intake study shows that both bird species prefer food with high protein contents because they ingested a larger amount of crude protein and fat than is provided overall in the diet. Does this mean that they favoured the high protein foods? Because the diets provided contain a high amount of fruit and vegetables, which remained largely uneaten, the protein content of the meal as given is greatly diluted. Again, I don't follow this – if they weren't eating fruit etc. why was the protein content diluted? With the birds selecting high protein items such as the respective patees, meat, mealworms and hard boiled eggs, they are able to counter the watering-down of macronutrients. Assuming that these birds have digestive systems that are adapted to being carnivorous/insectivorous, they should be able to digest feeds which are high in protein and fat (Klasing, 1999).

Both types of food are appropriate to these types of bird. It would be interesting to measure the amounts of chitin present in both feeds and their relative digestibility. This feature could possibly set each patee apart, bearing in mind the (expected) lack of animal fibre in the egg patee. The amounts of fruit given and eaten were disproportionate, with high amounts of wastage. During the entire intake study, the magpies left an average of 43% of their fruit mix (made up of 45% pear, 25% apple, 5% carrot, 10% tomato and 15% banana) which is equivalent to 37g daily. In contrast, the thrushes left 83% of their fruit mix, which averages to 56g. The amount of food ingested could be expected to vary in different seasons. Both money and time could be saved if this was taken into account during the winter months.

Both brands of patees appear appropriate and interchangeable for carnivorous and insectivorous bird species at the macronutrient level. The ingested portions of the Prosecto diet contained more fat and fibre fractions and slightly less protein. Protein is still present in adequate amounts; therefore, this should in no way affect the birds. The higher fibre fractions, however, could be important. Faunivorous birds are known to ingest insects, either as a main food source or opportunistically (Klasing, 1999). Their digestive system will have adapted so as to cope with the ingestion of chitin (which makes up the exoskeleton of insects); either by digesting and harnessing its energy or by using it as a source of fibre to aid the digestive process as ingesta passes through the intestines. Some taxa of insectivorous birds are known to strip the largely chitinous body parts away before ingestion (Kleiman *et al.*, 2010), but this behaviour was not witnessed by the observer. The Chestnut-backed Thrush ingested more than twice the amount of fibre fractions than they did in the egg patee diet, as well as ingesting more dry matter. It is possible that the chitin was not digested but served as a bolus to help accelerate passage of ingesta through the intestines, thus decreasing gut transit time and, as a result, increasing appetite. Chitin is often found in the faeces of softbill birds. Further research is needed to explore this hypothesis.

The micronutrients of both ingested diets are comparable in amounts. An observation that is worthy of mention is the very high iron content of Prosecto. There have been no counter recommendations because of this high iron content. However, if species are known to suffer from iron storage disease, this patee would not be appropriate for them. Following the results of this study, Haith's has reduced the iron content of Prosecto to 86 mg/kg and also created a low iron verson for Softbills (ZooSoft) at less than 65mg/kg. Prosecto is a feed that contains a large quantity of arthropods; these invertebrates are high in phosphorus and low in calcium. It was therefore expected that the calcium:phosphorus (Ca:P) ratio of the birds would suffer. Surprisingly, the thrushes increased their Ca:P ratio by 0.05. This indicates that, even with an egg-based diet, the Ca:P ratio can be inadequate. The magpies had ratio larger than 1 while ingesting the egg patee but as expected, it was reduced by nearly half when they were eating Prosecto. The diet could have been supplemented with a calcium supplement and cuttlefish – both of which would have corrected any imbalance - but this study was carried out without supplements so as to assess the theoretical nutrient values of the diet.

The birds studied were significantly more visible (that is, less out-of-sight) when they were feeding on Prosecto than when they were eating their normal diet. This could mean that they had more time to be seen by visitors – an important part of a zoo's conservation and educational message. Feeding, flying, locomotion on the ground and being mildly vigilant were all significantly increased. No direct link can be made between the new diet and the change in behaviours, but the results indicate that Prosecto does promote the display of those natural behaviours that are not related to breeding.

Conclusion

Many different species of birds are kept in captivity, many of which are omnivorous, faunivorous or insectivorous. Haith's Prosecto Insectivorous feed has shown itself to be as good in terms of quality as an egg-based patee. Prosecto may in fact be a better choice of diet if the brand would reduce the iron contents and increase the calcium amounts. It proved to be palatable to the birds and has a preferred macronutrient make-up that is suitable for faunivorous birds. While the birds under study were fed Prosecto, they were less out of sight and more frequently performed feeding, flying, locomotion and mildly vigilant behaviours. Further research should incorporate a similar study but be carried out before and during breeding time in order to measure any change in reproductive output.

Acknowledgements

This project would not have been possible without the support of Paignton Zoo's Curator of birds, Jo Gregson. I should like to thank the bird keepers at Paignton Zoo, including Peter Smallbones, Tom Tooley, Lesley O'Connor and Dave Westlake for their help with this project, as well as Prof John E Cooper and Simon King for giving advice and offering to review the manuscript.

Literature Cited

BirdLife 2004. *Urocissa erythrorhyncha*. 2006. *IUCN Red List of Threatened Species*. IUCN 2006. Available on <www.iucnredlist.org> Retrieved on 12 May 2006.
De Graaf, R.M. Tilghman, N.G. and Anderson, S.H. 1985. Foraging guilds of North American birds. Environmental Management 9: 492-536.

Kawata, K. 2008. Zoo animal feeding: a natural history viewpoint. Der Zoologische Garten 78: 17-42.

Klasing, K.C. 1999. Comparative Avian Nutrition. CAB International: Cambridge, USA.

Kleiman, D., Thompson, K. and Baer, C.K. 2010. Wild Mammals in Captivity: Principles and Techniques for Zoo Management, second edition. University of Chicago Press: Chicago, USA.

Stevens, C.E. and Hume. 1995. Comparative Physiology of the Vertebrate Digestive System: Second Edition. Cambridge University Press.

Trainor, C.R., Santana, F., Pinto, P., Xavier, A.F., Safford, R. and Grimmett, R. 2008. Birds, birding and conservation in Timor-Lese. Birding ASIA 9: 16-45.

* The Wilcoxon Signed Ranks test is designed to test a hypothesis about the location (median) of a population distribution. It often involves the use of matched pairs, for example, before and after data, in which case it tests for a median difference of zero.

THE BLACK-FACED LAUGHINGTHRUSH *Garrulax affinis*

By Paul Crowe

This article is based on my four years' experience of keeping this species. The Black-faced Laughingthrush *Garrulax affinis* is a hardy and peaceful species, not aggressive even when nesting. However when kept with other breeding birds in a flight they are rather prone to stealing eggs. I have observed them doing this. They wait until a target hen leaves her nest to drink and then make a lightning swoop onto the nest to take an egg or eggs.

These birds originate from the Himalayas at altitudes of 1500 - 4500 metres depending on seasonal migration, their natural habitat consists of broadleaf forests of rhododendron bushes, scrub oak and bamboo and mixed forests of oak and conifers. They are also found in South West China and the Shan hills in Myanmar. It was therefore assumed that they would be hardy in Dorset and Devon, and this proved to be perfectly true.

The pair that I originally kept occupied a mixed flight 30ft x 15ft x 8ft until their egg stealing habit was noticed. They were then transferred to a 6ft x 6ft x 6ft flight on their own with no internal flight attached. This aviary was initially quite sparsely planted but the birds seemed anxious and kept trying to hide in the corners. This behaviour was discussed with a friend who also has a pair of these birds (between us we have 92 years of bird keeping to look back on) and subsequently additional plantings were added including *Cornus*, *Rubus*, *Kerria* and Kiwi fruit *Actinidia*. This seemed to be more to the birds' liking as they became less prone to giving their alarm calls. These calls could be quite shrill with the pitch rising on the first two notes. However there was another call that seemed to be either a contact call or an alarm. This consisted of a loud rattle (that was somewhat like a set of wooden heels clattering on a wooden floor) which could be heard from quite a distance.

I fed them my standard mix of Bogena softbill food with added chick pellets (18% protein) together with mealworms, worms from a compost wormery, small to medium snails, assorted caterpillars, spiders and grubs from the local golf course, powdered crab shell, a small amount of fishmeal that had been ground smaller (2.5% protein?), powdered bone meal, dried cheese that had been finely grated with just sufficient fruit juice to ensure a crumbly mix. The earth worms and snails were put in a large shallow tray filled with damp leaf mould. This both kept them occupied and enhanced their surroundings. Fellow keepers are said to also include chopped fruit in the diet, but very little was taken by my birds, with the exception of berries (elderberry, cotoneaster, pyracantha, red/black/white currants, viburnum, yew, fuchsia and privet). Half a satsuma was regularly spiked on a nail halfway up one wall panel next to a favourite perch. This appeared to be welcome. However when half a ripe pear was used it was only taken erratically, as was apple. The sweeter the apple the more popular it was – Golden Delicious being the favourite. However when I tried them with half a tinned pear, they went for it voraciously. Pomegranate was totally ignored.

The nest was a bulky, messy construction forming a deep bowl. It was built from coir, hair (human and dog) sphagnum moss, mud and feathers. It was located in the fork of a sycamore branch that had been wedged in to the aviary framework to support climbing evergreen clematis. The nest was located at such a height that I could not see into it. However it was visible via a small CCTV camera. The eggs were blue with what appeared to be a greenish tinge. However the fragments collected from the floor after hatching also showed some purple/black patches at the blunt end although it is not known whether these were the result of the hatch rather than part of the original egg colouration. The hen appeared to take the majority of the incubating duties, and the total incubation period appeared to be 14-15 days. The parents were very attentive to the nest (too attentive in some respects as the cock bird became quite aggressive when the food trays were inserted). The first chick was ringed with size L ring at 4 days old leaving the other two chicks to be ringed the next day. However, the following day the parents had thrown the ringed chick on to the floor and by the time I saw it, it was unfortunately dead. I therefore decided not to ring the other two chicks rather than risk rejection. Fledging occurred at 13 days, although initially this was thought to be due to disturbance, since the two chicks were not very well feathered at all. The smaller of the two chicks had no tail, and the bigger one had a tail less than half size. The chicks were returned to the nest, but both jumped out within minutes. Flying ability was virtually nil, and they appeared to use their wings only to reduce the speed of their fall.

Despite this, both chicks were capable of scuttling around in the undergrowth with a fair turn of speed. They spent their time hiding, possibly freezing, in the ground vegetation only appearing to be fed by both parents. The chicks grew to full size and were fully feathered in a further 17 – 21 days. In a subsequent clutch two years later, the fledging period was virtually identical, with the chicks having the same scruffy appearance, so this may be normal for the species, or simply for this particular pair of birds. The chicks were removed at 63 days in case the parents began to get aggressive with them. Both chicks from the first clutch were DNA sexed as hens, and the single chick in the second clutch was a cock.

I sold all five to a group who approached me and were setting up a breeding programme in Dorset. Whereas I had trouble when ringing my chicks, my colleague in Dorset had no problems with rejection at all. However both his pairs only laid two eggs, hatched one and then reared it. His youngsters fledged at 15-16 days with chicks which looked as scruffy as mine, so this must be normal. He rings his chicks with a size M ring at 7 days old.

HAND-REARING VULTURINE GUINEAFOWL *Acryllium vulturinum* AT EDINBURGH ZOO

By Gavin Harrison

Introduction

Vulturine Guineafowl *Acryllium vulturinum* are the largest species of Guineafowl and the only member of a monotypic genus. They have an elongated, slender neck and long legs, with the head and neck being bare of feathers apart from dense chestnut down on the nape (del Hoyo et al, 1994). This vulture-like appearance makes it easy to see where the species name comes from. The rich blue colouration as well as black and white hackles and a red iris make this species a particularly striking bird.

Found in South Ethiopia, North West & South West Somalia as well as arid parts of North & East Kenya and South to Pangani (North East Tanzania), it is predominately a desert dwelling species that is found in very dry areas and in dense scrubland (del Hoyo et al, 1994). Naturally coming from a very hot, dry region has potentially been a contributing factor to the problems faced within captive collections in Europe. Individuals of this species are particularly prone to temperature related problems, such as being at high risk of frostbite. It is therefore vitally important that birds kept in Northern collections are provided with heated housing during the winter. The birds must be shut in and allowed to roost in a heated house overnight when temperatures are forecasted below 5°C and certainly when below freezing. On days when snow is on the ground or heavy frost is present, the birds should be kept inside. The house should therefore be large enough to allow the birds to be maintained inside for a number of days. Even short periods of exposure to snow or frozen ground can result in frostbite injuries.

Breeding Attempts

In 2007, two pairs of Vulturine Guineafowl were brought into Edinburgh Zoo from Prague Zoological Gardens. All four birds had been hatched that year and arrived in sub-adult plumage. The birds were kept together inside a quarantine unit over winter and then in spring moved to an aviary on show with a pea gravel floor, mesh sides and roof plus various planted areas. The aviary had a heated shelter where the birds were shut in overnight during particularly cold days. This heated shelter had timed lights and mesh covered tube heaters, with the door closed, the temperature was maintained above 10°C over winter. The adult birds were fed a varied diet consisting of a mix that was made up of Mazuri pheasant maintenance pellets (breeder pellets in spring/summer), mixed seed, finely chopped greens, insectivorous mix, grated carrot, chopped apple and boiled egg. Calcium supplement was added to the mix every other day. As well as the mixed plated feed, a number of insect scatters were offered daily, including mealworms, crickets, locusts and occasionally juvenile Madagascan hissing cockroaches – these were all relished by the birds.

During 2008, the females started to lay - some eggs were scattered around the enclosure and a number were laid in a single scrape. Some of the eggs were placed into a Brinsea polyhatch incubator (see "Artificial Incubation and Hand-rearing" Section for details) to determine their fertility, as all four birds were siblings, it was not intended to hatch any eggs at this time. None of these eggs in the incubator showed any sign of fertility.

In 2009, the four birds were moved into their intended long-term enclosure - the East African aviary, which was a large netted mixed species exhibit. The exhibit has a heated inside area that can be separated into five pens. Each door has hatches at ground and mid-level in order to allow a range of species access to the inside. The aviary is predominately grass covered with a central pool and a number of trees and shrubs. The species within the exhibit are mixed African, which in 2009 were pairs of: Lilac-breasted Roller *Coracias caudatus*, East African Crane *Balearica regulorum gibbericeps*, Hammerkop *Scopus umbretta*, Von der Decken's Hornbill *Tockus deckeni*, Violet Turaco *Musophaga violacea*, as well as a small antelope species - Kirk's Dik-dik *Madoqua kirkii*. Given that the Vulturine group were siblings, unrelated birds were sourced in order to make some exchanges. Early in 2009, two males were exchanged with birds in another UK collection, which were considered to be from an unrelated bloodline to the Prague birds. These two new males were mixed with the females in the East African aviary.

The new Vulturine group was maintained together within the exhibit for a couple of months before aggression was observed between the two males. The aggression was prolonged at times and even with the available space within the enclosure, the males were regularly chasing each other. The decision was then made to separate two pairs within the exhibit. One pair was given the majority of the area, whilst the other pair was allowed access to a holding area within the exhibit, which had an outside pen and indoor heated area. After separation, the pairs settled down fairly quickly. The males regularly attempted to reinforce their bonds with the females by picking up live food and stretching their neck forward while emitting a low pitched "chink" sound. The females responded by approaching with a submissive posture and the males would then offer them the live food. Both females began to lay eggs a few weeks after separation, and a number of eggs from both birds were placed in the incubator to determine fertility. However, all eggs removed during this time were infertile.

It was observed that neither female seemed to be particularly bonded to the males that they had been separated with. It appeared that the male in the larger part of the exhibit spent a considerable amount of time interacting with the female in the separation pen - the pair would spend time standing together at the mesh barrier and vocalising to each other. After a number of eggs proved to be infertile from both females, the decision was made to swap females over. These new pairings resulted in the pair in the main enclosure bonding well, spending a lot of time foraging together and keeping close vocal contact. Similarly, the pair in the smaller penned area was spending time foraging together and appeared to be bonding. The females both started to lay at around the same time, and as previously, eggs were laid randomly around the enclosure - often being found inside or near feed dishes. These eggs were removed and artificially incubated. The eggs removed from the main enclosure showed fertility however the other female's eggs were infertile.

With the continued threat of aggression between the males and the lack of fertile eggs in the separated pair, it was decided to move this male to another collection to allow this female to be introduced to the now fertile pair. The female was introduced to the pair in the main enclosure with the male initially showing some aggression but this soon settled down. Both females continued to lay after the introduction and, in 2009, twenty-two chicks were hatched and hand-reared. It was believed that these fertile eggs all came from the female that had showed initial fertility. The second female still appeared to be laying infertile eggs, which were removed from the enclosure.

In 2010, thirteen chicks were hatched and hand-reared. Over the breeding seasons of 2009 and 2010, a number of fertile eggs were laid as well as a similar number of infertile eggs. It is not clear why only one female was being mated by the male, though the pair bond with the other female was certainly not as strong, as the male would sometimes chase her away when live food was offered. In both 2009 and 2010, a scrape was made in the enclosure and both females appeared to lay eggs in this scrape. One female incubated eggs for over 20 days. However, given the particularly wet summers in Edinburgh in both years, the nest scrape became water logged and the eggs were found to be dead in shell. On one occasion, one chick did hatch under the female in the enclosure but was found dead soon after hatching - believed again to be due to the wet weather. Ideally, if the birds could be encouraged to nest inside or under good shelter, then parent rearing would probably have more chance of success. However, given the low numbers of Vulturine Guineafowl in European collections, the need to increase numbers took precedence and so the eggs continued to be artificially incubated.

Artificial Incubation and Hand-rearing

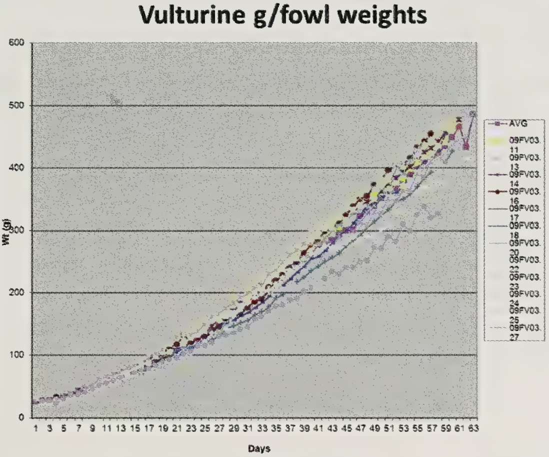
Eggs were removed from the enclosure and stored in the incubation room for a few hours in order to allow the eggs to come to room temperature before being placed into a still air Brinsea polyhatch incubator which was set at 37.5°C and 50-55% humidity. The digital thermometer probe was placed at the top of the egg within the incubator and the eggs were automatically turned. At 21 days, when internal draw down was observed upon candling, the eggs were transferred to a hatcher which was set at 36.5°C and 70% humidity. In general, the eggs hatched at 22 days. As with other precocial chicks, it is important not to have any uncovered open water sources in the hatcher as keets will invariably drown in such containers. A clean towel can be soaked with cooled boiled water and placed in the incubator, which is an excellent way to create a humid environment without risk of drowning. The towel must be washed between hatches. The hatched keets were left in the hatcher for 12-24 hours to ensure they were fully dried and standing before being transferred to the brooding unit. During this time, only small mealworms were offered to stimulate a feeding response.

For the first 2-3 days, the brooding unit was a human incubator which was set at 35°C. The keets were placed in a plastic container within the incubator with a mesh lid and towelling as substrate. Once dried off, the keets could be brooded with a red light as with most precocial chicks. Initially, the keets were offered ground Mazuri pheasant starter, very finely chopped greens and finely grated carrot. Feeding often started with live moulted mealworms as their movement was found to particularly stimulate the keets. To encourage them to drink, finely chopped greens can be sprinkled on the surface of the water dish. It is very important during these first few days to ensure that any water dish is either very shallow or preferably has small clean stones placed in the bottom to ensure they do not drown. The author often uses a coffee jar lid containing some small stones, as a water dish for very young precocial chicks. Alternately, a small plastic water hopper can be used, as the narrow base should prevent drowning.

The substrate for the keets, as with all precocial chicks, should be non-slip, so rubber matting or towelling work well (taking care to monitor any loose threads on the towelling). The diet was initially sprinkled on the bottom of the brooder floor to encourage the keets to start pecking and feeding. They were interested in live food very soon after drying off and when kept with siblings, they were quite aggressive over this, pulling at either end of the mealworms. It is worthwhile keeping a close eye on their toes, as Vulturine keets, as with other precocial chicks, can develop curled toes. It is unclear if this is caused solely by diet or substrate, though it is likely to be a combination of the two. Observations with this species from Amsterdam Zoo, found that, for keets kept on sand, keeping the substrate lightly dampened prevented toe curling (Dekker, 1970). As the keets grew, the size of the brooder area was extended and the birds were kept under a red light until they were almost fully feathered. Perches were placed in the pen as they will perch quite quickly. As with most other wild galliformes, the flight feathers come through extremely quickly, and they can fly within the first week.

Vulturine Guineafowl juveniles ranging from approximately 4-8 weeks of age

The keets developed well and the diet remained the same throughout the rearing period except that the mix became coarser as the chicks grew larger. Live food is extremely important for most galliforme chicks, particularly in the first two weeks and during growth periods. The key is not to over-feed live food. Once the keet's legs start to extend, it is vital to make sure that the protein and calcium/phosphorus ratio are balanced, otherwise there is a good chance that leg developmental problems will occur. Excessive amounts of protein at this stage may speed growth, often resulting in leg development problems such as bends or rotations. While live food is very important for development, it should be regulated, particularly after the first week of life. If more than one chick is present, targeting individuals or scattering live food rather than placing in the food dish will ensure that dominant individuals do not over-feed. 2-4 insects per bird a couple of times a day should be sufficient if the main diet is the same as the diet outlined here. Calcium supplementation should be offered daily over food at these rapid growth stages and, if there are concerns, liquid calcium can be used in the water, such as Zolcal-D, to boost calcium intake. With the diet and heavy monitoring of the keets' development in this study over two breeding seasons, only one out of 36 keets experienced a developmental problem. This individual presented with a leg rotation and had to be euthanized, so it was clear that diet and growth need to be monitored closely.



Weights of 12 keets hand-reared to independence at Edinburgh Zoo

Conclusion

Some collections in warmer climates have had success breeding Vulturine Guineafowl in large free roaming flocks. In the wild, it has been observed with many guineafowl species that during breeding, small family groups break away from the flocks to breed (del Hoyo et al, 1994). In the author's opinion, when breeding is the main intention, Vulturine would be best kept in single pairs or as one male with a limited number of females, in order to reduce male competition which may disrupt copulation and nesting. Allowing the formation of strong pair bonds with little disruption from competing males seems to be key to getting fertile eggs. Following this advice, another UK zoo collection that previously held their Vulturine Guineafowl in a large group, split the group into what appeared to be bonded pairs and moved them into separate aviaries. Subsequently, this collection has now achieved breeding success with this species for the first time.

Vulturine Guineafowl come from a very dry region where it is likely that dietary nutrients may be low during much of the year. It is therefore important to take great care when rearing keets not to overfeed protein, particularly after the first week when leg growth starts to increase rapidly. Calcium is also essential within the diet of these long-legged Guineafowl. Additionally, Vulturine seem to be very susceptible to cold temperatures. They should therefore have heated shelter over winter nights and not be allowed out on particularly cold days. An aviary in a wet shaded area will probably not be conducive to healthy birds and certainly not to successful breeding with parent rearing.

References

del Hoyo, J., Elliott, A. and Sargatal, J. (1994). *Handbook of the Birds of the World*, vol. 2: *New World Vultures to Guineafowl.* Lynx Edicions: Barcelona, Spain

Dekker, D. (1970). Breeding Vulturine Guineafowl: at Amsterdam Zoo. International Zoo Yearbook 10(1): 98

Wexler, P. (1996). Breeding the Black -crested Guineafowl at Birdworld. *Avicultural Magazine*, 1021: 12-14

THE LEAR'S MACAW *Anodorhynchus leari*

By Dr. Matthias Reinschmidt, Zoological Director, Loro Parque, Tenerife

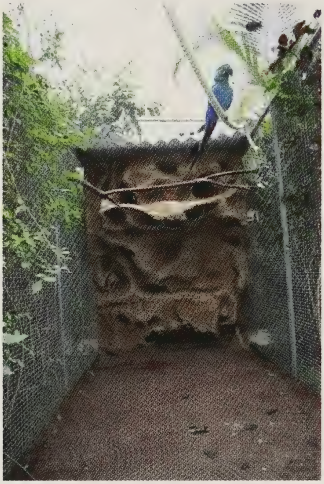
On the 31st December 1978 it finally happened: the German-born Brazilian ornithologist Prof. Helmut Sick, who had taught at the University of Sao Paulo, finally achieved his goal. He found the distribution area of the Lear's Macaw *Anodorhynchus leari* in the Caatinga in the north-east of Brazil, a barren dry area, where just a few rock cliffs rise out of the landscape. Scientifically the Lear's Macaw had already been known since 1856, when Bonaparte described it and thus introduced it into the scientific literature. There were also museum specimens and sporadically animals appeared in zoological facilities around the world, but no one exactly knew where the animals came from. The Lear's Macaw was exhibited in 1900 in Germany together with the Hyacinth Macaw *Anodorhynchus hyacinthinus* and the now-extinct Glaucous Macaw *Anodoryhnchus glaucus* as well as the Spix's Macaw *Cyanopsitta spixii* in the Berlin Zoo (Juniper, 2002). This was probably the only time that, as a visitor, it was possible to see all the four blue macaw species and this will never happen again, because the Glaucous Macaw disappeared from the planet forever in middle of the last century. Although there are always some rumours that it still exists in some breeding facilities, until today this could never be confirmed and it is also very unlikely. The specimens of these animals are kept today in the Natural History Museum in Berlin, so the animals still can be compared very well, even though unfortunately they are not living animals.

Although it was known that the Lear's Macaw was from Brazil, this is the fifth biggest country on earth and as such it was a life's mission for Prof. Sick to find the habitat of the Lear's Macaw in this infinitely vast and diverse country. Numerous expeditions in his research career took him to all parts of Brazil, until he finally, during his last expedition, and already 73 years old, had the great luck to discover the Lear's Macaw in the sandstone cliffs at Canudos.

In the year 2006, exactly 28 years later, I stood for the first time in front these cliffs at Canudos with Caboclo, son of the local guide who, together with Prof. Sick, had discovered this rare macaw. Caboclo, who was then ten years old, accompanied his father during the visit of Prof. Sick. Today he is one of the guards who watch over this unique area, to prevent poachers continuing to steal illegally more chicks from the nests in the cliffs. During this discovery, the counting data showed that fewer than 100 Lear's Macaws made up the remaining wild population. On its behalf, protection measures were taken together with the Brazilian conservation authority, supported in part by the Loro Parque Fundación (LPF) with significant financial resources. In this way, the remaining population has recovered so much that the Lear's Macaw could be downgraded in the IUCN Red List of Threatened Species from "Critically Endangered" to "Endangered", because now the number of animals in the wild has increased to 1,200 animals. A great success for the protection of nature and species.

At the same time, an attempt has been made to build up a genetic reserve in captivity. In 2006 there were just 50 individual Lear's Macaws in the International Studbook, which mainly were confiscated by the species protection authorities worldwide. Until that year, only twice had there been breeding success: in 1982 in Busch Gardens, USA with two chicks (both were transferred to the LPF a few years ago for breeding) and in 2006 one chick at the AWWP in Qatar.

In November of 2006 in the Sao Paulo Zoo, I had the opportunity to receive two adult pairs of Lear's Macaw that had been held there for many years, to transport to the LPF for breeding purposes. They were sent on breeding loan, because all officially captive Lear's Macaws are owned by the Government of Brazil. After a thorough quarantine period, the two pairs were brought to the breeding centre of the LPF in separated aviaries for each pair that were specially built for them. Following the example from the wild, where this macaw species breeds exclusively in rock cliffs, at the end of each aviary of 11 metres length a back wall of artificial rock was made and painted in the same reddish sandstone colour that I had seen before in Canudos. Two crevices formed the entrance to the nesting cavities, which led to the 'normal' wooden nest boxes at the end, and which can be checked from outside. The macaw pairs accepted these cliff walls immediately, because macaws also like to spend the night inside the cavities outside the breeding season.



Picture of Lear's Macaw Aviary

Just two months later, one of the pairs started to lay eggs, the first egg unfortunately being damaged, and with a second egg which had cracks in the shell. We removed it, glued the cracks on the shell with UHU glue and placed it under an experienced breeding pair of Red-and-Green Macaws *Ara chloroptera*. 26 days later the young hatched, and was reared very well by its adoptive parents. The parent pair of Lear's Macaw laid a second clutch, from which two young hatched, one of which was adopted by another pair of Red-and-Green Macaws and the third youngster of the year was reared perfectly by its own parents. Thus, the LPF was in the year 2007 the third institution worldwide to rear Lear's Macaw successfully in captivity.

Then, in the following year, both pairs started to breed and by the end of the year there were four young, two from each pair. In the year 2009, four young were reared, and the absolute record year was 2010 with seven young. Until today both pairs breed regularly, so that between 2007 and 2013 a total of 27 young Lear's Macaw have grown and fledged at the LPF.

Picture of Lear's Macaw

Both pairs have always been able to rear the young naturally without any problem. In the last year a pair was even able to rear three young in one nest. If the first clutch is removed for the chicks to be foster-reared or hand-reared, as was the case especially during the first years in order to increase the number of young, a second clutch is produced that remains with the parents to be reared naturally. In the last two years even the first clutch has remained with the parents for their own rearing, which naturally does not allow a second clutch. Due to the offspring that the LPF now has, it has become a question of capacity, because the total number of Lear's Macaw in the LPF is 30.

In 2010, during a TV production for the German channel SWR, and within the frame of the International Breeding Programme, I had the opportunity to take back to Brazil a Lear's Macaw bred at the LPF. There he was put together with a partner bird in the Belo Horizonte Zoo. As long as the population in the wild continues to develop well, a reintroduction of animals bred under human care is not necessary. However, the breeding programme is important in order to provide a safety-net, a genetic reserve under human care, in case the wild population suffers again in the future, and it will be possible to fall back on the captive reserve. In this sense it is prudent to build up a well-functioning breeding stock, as is the case for the Spix's Macaw, extinct in the wild.

Currently, Loro Parque is the only zoo in Europe where you can see Lear's Macaws. These birds are actually in various aviaries, also in close proximity to the nearest relative, the Hyacinth Macaw. This allows the viewer a wonderful comparison of the two macaw species. It is noteworthy that the one metre Hyacinth Macaw has a deeper, brighter dark cobalt blue and is certainly bigger and much stronger than the Lear's Macaw, which tends more to blue-green on the chest and abdomen area. The Lear's Macaw has, in contrast to the Hyacinth Macaw, a white eye ring around the eye, but otherwise also a featherless yellow area around the eye and at the cheek area.

For me personally, it was one of the greatest breeding challenges to build up a breeding line from two adult Lear's Macaw pairs, of what was then a critically endangered parrot species. That this was a big success at the LPF is certainly due to the animals adapting well to the environmental conditions and to the artificial breeding rocks, as well as the diet with the addition of palm nuts from the genus Licuri, and a big dose of luck.

I have detailed my breeding experiences with the Lear's Macaw at the Loro Parque Fundación in a specific report in PAPAGEIEN Magazine (Reinschmidt, M., 2009a), which will certainly show many new things to the interested reader.

Literature

Arndt, T. (1990-1996): Parrots Lexicon. Bretten.

Juniper, T. (2002): Spix's Macaw, The Race to Save the World's Rarest Bird. Washington Square Press. New York.

Reinschmidt, M. (2009): Colour Atlas Parrots, Ulmer-Verlag. Stuttgart.

Reinschmidt, M. (2009a): European first breeding of the Lear's Macaw. PAPAGEIEN: Jg. 22. S. 188-195.

Reinschmidt, M. & Waugh, D.(2010): Keeping and breeding of the Spix's Macaw in the Loro Parque Fundación. PAPAGEIEN.

NEWS FROM LORO PARQUE, MAY 2015

By Dr. Matthias Reinschmidt, Zoological Director Loro Parque, Tenerife

In Mid-May we are at the absolute peak of the parrot breeding season. In fact, over 200 young parrots are being reared, while many pairs in the Breeding Centre "La Vera" are rearing their own young.

In our new Rearing House, visitors to Loro Parque can observe from very close how the little parrots are fed, weighed and cared for from the first day of life to independence. Much better than before, the new Rearing House provides a special insight into all stages of growing up.

At the moment we are pleased to have some important chicks, because three Brown-necked Parrots *Poicephalus robustus fuscicollis* are currently growing very well and are already being ringed.

With the Lories, the young Blue-streaked Lory *Eos reticulata* should be noted, as well as the three young Red-flanked Lorikeets *Charmosyna placentis placentis* from two pairs.

Some *Pyrrhura* parakeet species can already boast their first chicks, seven young Emma Parakeets *Pyrrhura leucotis emma* from a single clutch.

We are also pleased with the *Pionus* parrots: two pairs of White-crowned Parrots *Pionus seniloides* have successfully hatched four chicks. Another pair is still incubating their eggs.

Especially successful this year are our Red-breasted Parakeets *Psittacula alexandri*, because all four subspecies, which are held in the collection, may already have chicks. In addition to the nominate form of the Red-breasted Parakeets *Psittacula alexandri alexandri*, are the Andaman Moustached Parakeet *Psittacula a. abbotti*, the Dammerman's Moustached Parakeet *Psittacula a. dammermanni* and the Indian Red-breasted Parakeet *Psittacula a fasciata*.

The year has been good also for the Cockatoos, and we have had from them 37 young from nine different species. Outstanding among these young are 14 Major Mitchell's Cockatoo *Cacatua leadbeateri*, seven Eleonora's Cockatoos *Cacatua galerita eleonora*, four Salmon-crested Cockatoos *Cacatua moluccensis* and three Western Corellas *Cacatua pastinator*.

Young cockatoos of various species in the Rearing House at Loro Parque

In early May was the 17th Parrot Workshop in German, held in cooperation between LPF and Arndt-Verlag. Like every year, almost 50 parrot lovers from Germany, Austria and Switzerland met for a week at Loro Parque to learn everything related to parrots through lectures, practical exercises and guided tours behind the scenes. Speakers for the participants were Prof. Dr. Michael Lierz of the University of Giessen, Thomas Arndt and René Wüst from Arndt-Verlag and Rafael Zamora and Dr. Matthias Reinschmidt from LPF. This successful cooperation between Arndt-Verlag and LPF has taken place since 1998, and it is so popular among the participants that almost the fifty percent of them had returned. In fact, four participants have already been included 10 to 13 times.

Practical demonstration of professional parrot hand-rearing by Dr. Matthias Reinschmidt and Isabel Cabrera Dóniz

The cinema at Loro Parque has recently acquired a new film. A 20 minute short version of the successful film "Rio", which is about the last two Spix's Macaws. It is shown in a 3D version in English, Spanish and German nine times a day and has become very popular among the young visitors to the park.

AVIAN NUTRITION RESOURCE WEBSITE

By Rob Monk

What we feed our birds has a direct effect on their health and productivity. The majority of species can survive and breed on diets which do not necessarily cater fully for their nutritional requirements and over time inappropriately balanced diets could cause health issues in individuals, their offspring or indeed, over generations, captive populations.

Creating a new diet can be quite a bewildering exercise: where do you start and how do you know that you are creating a nutritionally balanced diet for your birds?

The best attack plan is always research, research and then more research, followed by observation of your birds, breeding success and longer term, general health and longevity.

Creating a detailed feeding plan is a good place to start. Gather together as much information available regarding the wild diet of the species: cross-referencing information from different sources should provide a comprehensive overview. Ensure you include any information regarding the feeding habits of the species: this knowledge may well be useful when considering diet presentation.

Next, gather together as much known information on captive diets - husbandry guidelines are always a good starting point; there may be published papers available on diet based research, and contact other individuals who have worked with the species. Pay special attention to any known dietary health issues with the species.

Evaluate all the information you have gathered and start to think about diet ingredients. From the wild data compare what items are readily available to you locally. How do these items compare to wild counterparts? Remember commercially grown fruit is propagated for human taste and may not contain the same nutritional qualities. Also investigate what manufactured diets are available.

Healthy diets don't have to mean more expense: if you can control food waste through a combination of knowing the dietary requirements of your birds, monitoring diet intake, removing all diet ingredients from a diet that do not add anything to the nutritional needs of the birds and regularly research prices from your suppliers, you will be surprised at how cost effective nutritionally balanced diets can be. Add into that an increased productivity, better health, fewer vet bills and longevity and it all makes good economic sense.

In 2013 in order to raise awareness of the nutrition of our captive birds and promote research and evolution of this crucial chapter of avian husbandry the Avian Nutrition Resource was launched. The concept for this resource came about in 2012 over an email discussion between

Rob Monk and Louise Peat who had similar ideas regarding increasing fibre content in softbill diets. Both individuals realised their opinions had been greatly influenced by the work done on nutrition of toucans by Laura Gardner.

Frustrated by the lack of information regarding avian nutrition, a plan was formulated to create a sister resource to the existing Avian Rearing Resource.

Work then began to compile as much information on the subject to enable bird keepers easier access to information and resources to help them better understand the subject.

Topics covered include information about how to go about researching your own diets, the avian digestive system, nutritional elements and an extensive database with links to papers about wild diets, captive nutrition and diet studies, nutritional health problems and an area to include diets in use.

The Avicultural Society has generously supported this resource with £500 going towards the development of the website. We would like to take this opportunity to thank the Avicultural Society for this contribution and hope that members of the society will not only make use of this resource but will also contribute towards the growing informative content of the website. If you know of any articles that are missing from the website, or would like to share your own diets and information do get in contact. http://www.aviannutritionresource.co.uk/index.php aviannutrition@gmail.com.

HANDBOOK OF THE BIRDS OF THE WORLD ALIVE
LYNX EDITIONS PUBLICATIONS WITH BIRDLIFE INTERNATIONAL

By Jo. Gregson: Curator of Birds, Paignton Zoo

Many of us have been using the Handbook of the Birds of the World since the first volume was released in 1992. The series has been an invaluable resource of information for professionals and hobbyists alike. It is not easy to imagine life without it. Even so, a price of around £180 for each of the 16 volumes can be a bit intimidating. Many of us have collected them as they were published, but for new subscribers it is a big outlay.

These days more and more people are using the internet for their research and there are plenty of bird guides to be found in electronic formats. During 2013 Lynx Editions created a live web based edition of the HBW. The new online database has used the HBW hard copies as a foundation. It includes information on all the species accounts that can be found in the 16 volumes, and offers some snappy additions that cannot be replicated in a book.

The user-friendly site includes an index of the Orders on the left hand side that has drop down options for the Families. From the family index there are then drop down options for individual species. An easier option is the search box that can be used based on scientific or common names or for a wider search such as finches. Another useful tool is the "compare" option where you can select similar species, for example a Swinhoe's, Edward's and Imperial pheasant could be selected and then viewed on the same page with all their text side by side. For many of the species there are video clips, sound recordings and photos. The HBW Alive site is linked to the free "Internet Bird Collection" http://ibc.lynxeds.com where 94% of the world's birds are covered in various formats.

All members have a password and can visit the site whenever they have a connection. I have used HBW all over the world without any problems. The site can also be opened on iPad, Android pads, and Smart Phones. It is not possible to access the videos on those devices that don't have a flash drive, otherwise they run very smoothly. The small phone screens are a bit fiddly, but are certainly good enough for short periods.

I find the membership to be good value: it would take many years of membership to get anywhere near to the cost of the hard copies. The convenience of having the E books wherever I am means that I now use the Alive site far more than the books.

There is an option to take the higher grade "Supporting Membership" which allows access to the over 90,000 bibliographical references used. Providing the original abstracts are available on the internet you will be able to open them from the links provided. There is also a new, "My Birding", section that allows you to record your bird sightings along with other information about your trips.

The cost of membership for one year is £29.95; there is also a one off registration fee of £20. The cost of the supporting membership for one year is £ 44.95, plus a one off registration fee of £20. For more information about Lynx Editions go to http://www.lynxeds.com.

RAYMOND SAWYER SCHOLARSHIP 2015

The Society was delighted to receive a greatly improved response to the scholarship in its second year. The very strong field of 19 candidates presented the selection panel with an extremely difficult task. The majority of applications were from the UK, but we also had applicants from Belgium, Germany and the Netherlands, and even one from the USA.

Many candidates have, or had started with, their own bird collections, but most are now trying to build careers in aviculture and avian conservation. Some are already employed as keepers, others working towards this goal through study and voluntary placements, while others are simply aiming to improve their skills as hobbyist breeders.

With a number of excellent candidates, the competition for this year's scholarship was a close-run contest, but the scholarship was eventually awarded to Rosemary Drew. Rosemary, who has a special interest in incubation, is from the UK, but is currently working with hummingbirds at a breeding centre in Italy. She impressed the selectors with the way she had pursued opportunities to improve her skills and knowledge in specific areas, and had then applied what she had learned directly to improve the management of species in her care and pass on techniques to others. Therefore we are confident that she will make the best use possible of the scholarship.

We look forward to hearing Rosemary's experiences at the course, and look forward to an equally, if not more, successful response to the scholarship next year. We are grateful to Cage & Aviary Birds for their cooperation in publicising and awarding the scholarship, and to Tim Wright at Durrell for his valuable input.

NEWS & VIEWS

A NEW SPECIES OF FLYCATCHER

A new species of Flycatcher has been discovered on the Indonesian island of Sulawesi. Sulawesi is renowned for its high degree of endemism amongst its fauna and the new species *Muscicapa sodhii* adds to this number. First seen over 15 years ago and reported in numerous locations throughout the country it was not until 2012 that the species was officially described to science.

Superficially resembling the migratory Grey-streaked Flycatcher *Muscicapa griseisticta* which winters in Sulawesi it differs in several morphological characters, song and DNA makes it a quite distinct species.

Because of its reputed tolerance of disturbed habitat and wide distribution in lowland and submontane regions it is not considered to be endangered.

* * *

BLYTH'S TRAGOPAN *Tragopan blythii*

The winter 2014 issue of WPA News has as its front cover a male Blyth's Tragopan *Tragopan blythii* showing red facial skin instead of the usual yellow. This photo of a wild bird was taken in Myanmar by Wang Nan. Searches have revealed several other photographs of similar red-faced birds and it is hoped that as more work is done on the population in Myanmar by Wang Nan and others, a greater understanding will emerge of this striking species. The back cover portrays the Sichuan Partridge *Arborophila rufipectus* taken in the Sichuan Laojunshan National Nature Reserve in China. Articles covering both species can be found within its pages, as can a wealth of Galliform related items.

* * *

HAWAIIAN HONEYEATERS HYBRIDISATION

The first recorded hybridisation between Hawaiian Honeyeaters has been recorded between the Liwi *Vestiaria coccinea* and Apapane *Himatione sanguinea*. An unusual Honeyeater captured on Hawaii Island on 28th May 2011 was measured, ringed and a feather taken for DNA analysis. Results proved the bird to be an F1 hybrid.

* * *

GURNEY'S PITTA *Pitta gurneyi* CRITICALLY ENDANGERED

Although long suspected, but only officially rediscovered in 1986 in Khao Nor Chuchi, Khlong Thom District, Krabi, Thailand, some 50 years after the last verifiable record of its existence, Gurney's Pitta *Pitta gurneyi* is again feared to be extinct in Thailand. The three remaining birds, a male and his two daughters, have not been seen for some time.

The discovery of this species in 1986 sparked international publicity and a wave of support for its protection. Attempts to protect a viable area of rainforest long term, failed miserably for the usual reasons.

They are still thought to number several thousand pairs in an area of rainforest in southern Myanmar where it was discovered in 2003 but unfortunately none of the habitat is within protected areas. The future looks rather bleak for this beautiful species.

The full report by Professor Philip D. Round can be viewed from the Siam Society homepage at www.siam-society.org.

* * *

MADAGASCAR POCHARD *Aythya innotata* IN NEED OF HELP

The first ever study of the Madagascar Pochard *Aythya innotata* has revealed that 96% of the young die before fledging and concluded that the species is unlikely to survive without a considerable amount of help.

Twice declared extinct, a small population of some 20 to 25 birds was discovered at the remote Lake Matsaborimena in northwest Madagascar in 2006. But because it is formed from a volcanic crater, the depth of Matsaborimena is too great for the chicks to dive and feed. Ducklings often starve before they are old enough to hatch their own young and it was concluded that an additional area was needed to support this species.

A search by the Wildfowl and Wetlands Trust scoured Madagascar to find a suitable site that would be able to support them and found it at Lake Sofia – the most intact remnant of the once vast wetlands of Bealanana in northern Madagascar.

This lake supports a large community that relies on fishing and farming. So safe-guarding and working with them is paramount to any future success. The project involves many partners and it is hoped that the captive population of over 50 birds can act as a buffer and a source of population for future releases.

* * *

MAURITIUS PINK PIGEON

The history of the Pink Pigeon *Nesoenas mayeri* is well known, and work both in the wild and in captivity continues apace.

The free-living population on Mauritius has reached 400 individuals and struggles to go beyond that number. As a result of this, sub-populations in the south of the island have been created, one of which is on the off-shore island of Aux Aigrettes. This has increased the capacity and a further three sub-populations are planned in the coming years with the hope of increasing the wild population to 600. However, disease, predation and habitat loss continue to be inhibiting factors in a fully self-sustaining population. Daily feeding of all wild pigeons allows close monitoring of the project.

Captive breeding both in Mauritius and in Europe has been a very important tool in helping to conserve this pigeon but the population in Europe is below capacity and the EEP drew up some recommendations for the continued survival of this species in Europe which, as of March 2014 stood at 43 (with a further 10 North American birds in AZA collections).

Following initial results from a molecular genetic assessment of the captive population, it was found to contain unique alleles (genes) that are not present in the wild population. Pending final results, re-evaluation of certain lineages for re-introduction will be prioritised.

Most of the birds held in captivity are in public collections and they are crucial to the survival of this species – it is not a 'wow factor' species and will need a considerable effort to ensure its long term survival in captivity.

* * *

WHAT DO YOU WANT FROM YOUR SOCIETY?

I am sure, like many on the Council of the Avicultural Society, I have been cornered on a number of occasions by a Society member who wants to know what is happening to this and what is going on with that and when this is going to happen. Of course, that is what we are elected for, so in 2013 I proposed to the Council that I put out a questionnaire to the members to ask them what they wanted from their Society. The initial questionnaires were handed out at the AGM at Whipsnade Zoo on the 8th September 2013 and then subsequently on our website and in the Society magazine.

I was hoping for quite a good response considering we have over 200 members worldwide, unfortunately I was quite disappointed with the number of returns, with the final number being only 40.

The questionnaire was as follows:

The Avicultural Society Council would like to know *your* views on your society. Could you as a member take a few minutes to answer the following questions to help us run the society as efficiently as we can and in your best interest?

1. **NAME**
2. **HOW LONG HAVE YOU BEEN A MEMBER?**
3. **WHAT DO YOU FEEL YOU GET OUT OF THE SOCIETY?**
4. **WHAT IMPROVEMENTS IF ANY DO YOU THINK WE COULD MAKE TO THE SOCIETY?**

As I have already said, we had 40 replies, 9 from council, 26 from UK members and 5 from abroad.

Out of these, 20 were received by email and 20 by post.

Below is a breakdown of the result.

Question 2.

1 to 5 years, 4 members.

6 to 10 years, 9 members.

11 to 20 years, 5 members.

21 to 30 years, 3 members.

31 to 40 years, 4 members.

41 to 50 years, 6 members.

51 to 60 years, 2 members.

One member said 'forever' and the remaining 6 members did not answer the question.

Question 3. (highest number 1st)

1. Good quality magazine.
2. Social meetings, catching up with old friends and fellow members.
3. Being part of a special society.
4. Visits to other collections.

Question 4. (highest number 1st)
1. More use of the internet, improve the web site.
2. Magazine to be printed on time. Increase membership especially the younger generation.
3. More social events.
4. Council should present a more welcoming face and have more interaction with the members.

5. More links with other collections and zoos.
6. More attractive magazine. Online magazine. More visits to private collections. For sale section in magazine for birds and equipment.
7. Let members know how they can contribute short communications and notes for the magazine, does not have to be a long article. More involvement by members in the society. Reprint of older articles. More information about authors, e.g., country, possible email address. Cut down to 2 magazines per year and make bigger, e.g. A4. Increase membership fees.
8. More exposure to the Avicultural press. Social secretary needed. Membership card to allow members for reduced admission price to zoos etc. Breeders register. Visit to foreign dealers. Annual show similar to the Dutch show. Incentive for people to write articles. Open election of council members. Published society accounts. Feedback section in magazine. More meetings in the north.

The results of the questionnaire were presented to the council at the council meeting at Lotherton Hall in April 2014 and as you can see they make very interesting reading.

Geoff Masson
Livestock Manager
Paultons Park, Ower, Romsey, Hants. SO51 6AL
geoffmasson@paultons.co.uk

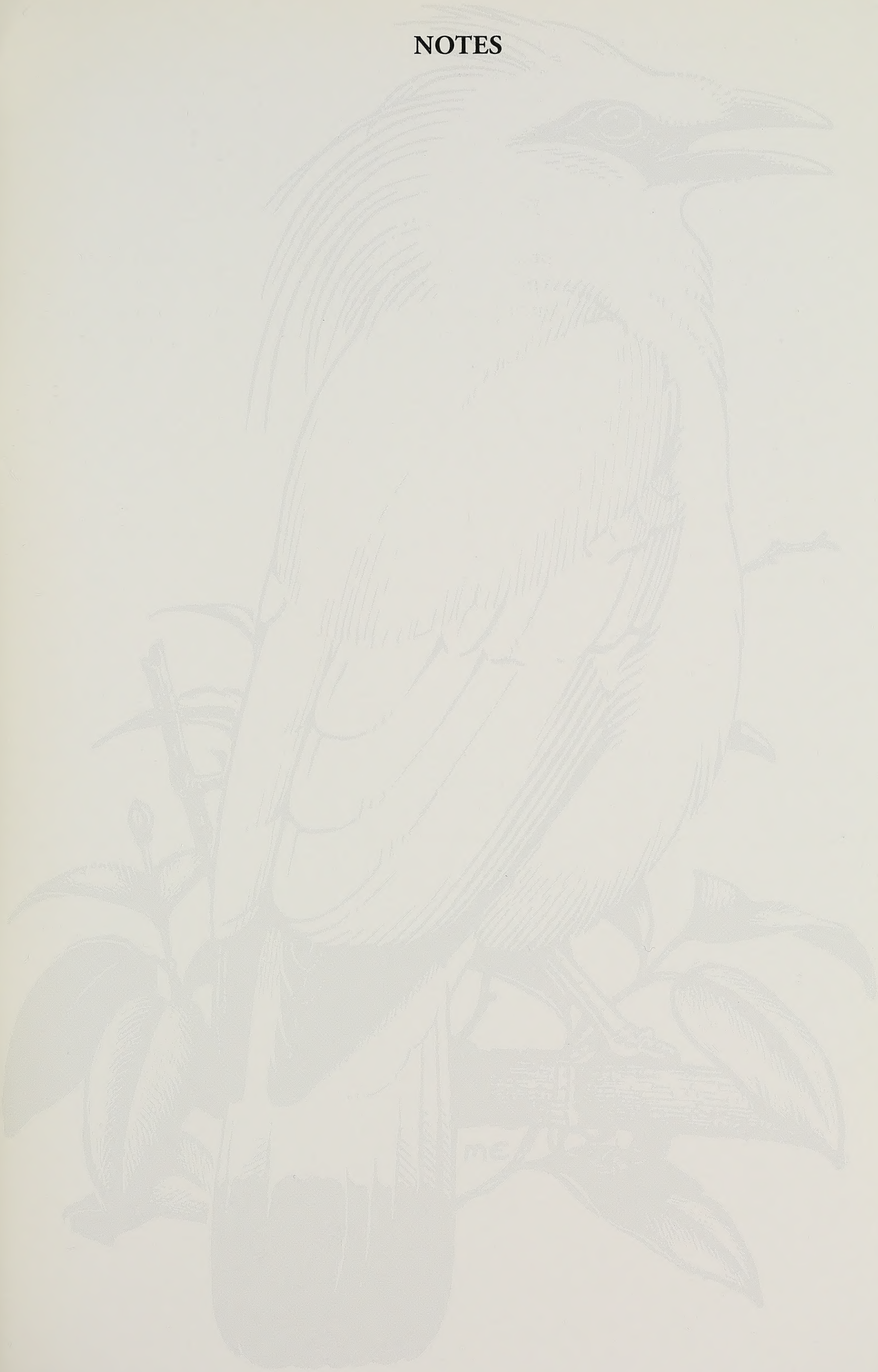
* * *

NEWS ITEMS WANTED

News & Views has been a part of the Avicultural Magazine for a good many years and is an excellent vehicle for snippets of information and interesting comments. The Society gets a number of magazines from other societies, both ornithological and avicultural, and it is from these that many items are gleaned. Complete articles are always welcome, but if you feel unable to write a full account, why not send a few notes for publication in News & Views.

Please send any short items to dave.coles@bealepark.co.uk, they can be literally anything to do with birds.

NOTES



CONTENTS

From the Chairman 2

Experiences with Collared Finchbilled Bulbuls at Blackpool Zoo, UK
By James Caldwell 3

An Introduction to Cockatiels
By Bert Van Gils 8

Naturalistic Insectivorous Bird Diets in Zoos
By Francis Cabana and Dr Amy Plowman 13

The Black-faced Laughingthrush
By Paul Crowe 21

Hand-Rearing Vulturine Guinea Fowl at Edinburgh Zoo
By Gavin Harrison 23

The Lear's Macaw
By Dr. Matthias Reinschmidt 29

News from Loro Parque, May 2015
By Dr. Matthias Reinschmidt 33

Avian Nutrition Resource Website
By Rob Monk 36

Handbook of the Birds of the World ALIVE (Review)
By Jo. Gregson 38

Raymond Sawyer Scholarship 2015 39

News & Views 40

SMITHSONIAN LIBRARIES
3 9088 01816 7007

Published by the Avicultural Society, England